

Industrial
Pollution
Prevention
Planning

Meeting Requirements
Under The New Jersey
Pollution Prevention Act

Guidance for Electricity Generating Industries

Standard Industrial Classifications 4911, 4931, 4939

New Jersey Department of Environmental Protection
Office of Pollution Prevention and Permit Coordination
May 2000

I. INTRODUCTION

This guidance is intended as a supplement to the document published by the Department in September 1995 which provides step-by-step procedures for covered facilities to prepare Pollution Prevention Plans under the requirements of the New Jersey Pollution Prevention Act (N.J.S.A. 13:1D-35 et seq.) and the Pollution Prevention Program Rules (N.J.A.C. 7:1K-1 et seq.). This earlier document entitled "Industrial Pollution Prevention Planning: Meeting Requirements Under The New Jersey Pollution Prevention Act," was intended to assist covered facilities with Standard Industrial Classification (SIC) major industrial groups 20 through 39, which are the initial SIC groups required to submit to the United States Environmental Protection Agency (USEPA) a Toxics Release Inventory (TRI) Reporting Form R under Section 313 of the federal Emergency and Community Right to Know Act of 1986 (EPCRA). Any facility in these codes is covered if it manufactures processes or otherwise uses a substance on the TRI list in excess of 10,000 pounds per year. A facility that is required to submit to the USEPA a TRI Reporting Form R is then also covered under the New Jersey Pollution Prevention Act (N.J.S.A. 13:1D-35), and must comply with the requirements of Pollution Prevention Planning. The Department document published in September 1995 was written as a general guidance to assist facilities in all of these initial SIC codes to prepare their Plans.

Under the latest federal TRI rules (40 CFR Part 372, May 1, 1997), facilities in additional SIC codes became subject to the TRI reporting requirements, and thus to the New Jersey Pollution Prevention Planning Rules. Covered facilities having these codes must prepare their Pollution Prevention Plan with 1999 as base year and submit their Plan Summary by July 1, 2000. The first Progress Report for these groups of facilities is due July 1, 2001. Although the existing Department guidance document is still useful for the most part in preparing Plans, some industry-specific considerations must be taken into account. Some of the pollution prevention methods appropriate for facilities in the initial SIC codes do not pertain to these additional types of industries. The additional industries identified in the federal rules are as follows:

1. SIC codes 10 (metal mining) and 12 (coal mining), except for facilities in the following industry codes: 1011 (iron ore mining), 1081 (metal mining services), 1094 (uranium-radium-vanadium ore mining), and 1241 (coal mining services).
2. SIC codes for electric utilities, 4911, 4931 or 4939 (each limited to facilities that combust coal and/or oil for the purpose of generating power for distribution in commerce). These codes refer specifically to electric services (4911), electric and other services combined (4931) and combination utilities, not otherwise classified (4939).
3. SIC code for commercial hazardous waste treatment, 4953 (limited to facilities regulated under the hazardous waste management standards of the Resource Conservation and Recovery Act, Subtitle C, 42 U.S.C. section 6921 et seq.).
4. SIC codes 5169 (chemical and allied products- wholesale), 5171 (petroleum bulk terminals and plants (also known as stations) - wholesale)
5. Solvent recovery services facilities limited to those primarily engaged in solvent recovery services on a contract or fee basis (included among a long list of businesses under SIC code 7389, Business services not otherwise classified)

The Department has determined that facilities whose business is solvent recovery services (SIC 7389), are not regulated by the Worker and Community Right to Know or the Pollution Prevention Planning programs.

A new series of guidance documents has accordingly been prepared to assist the newly-covered industries in New Jersey in preparing their Pollution Prevention Plans.

This guidance document focuses on pollution prevention planning for electric service facilities, SIC 4911; electric and other services combined, SIC 4931; and combination utilities, not otherwise classified, SIC 4939. For each of these SIC codes, pollution prevention planning is limited to facilities that combust coal and/or oil for the purpose of generating electricity for distribution in commerce.

Electric utilities with coal or oil fired boilers represent a significant source of pollution in terms of releases to air and water. While the primary focus of a pollution prevention plan is to gather inventory data and identify reductions in the use and nonproduct output for hazardous substances, it is hoped that development of a pollution prevention plan provides an opportunity to identify pollution prevention activities that will reduce environmental impacts beyond just hazardous substances. For example, reductions in demand for energy will result in reductions in air emissions of nitrogen oxides, sulfur dioxide, particulate matter and carbon dioxide (also known as a greenhouse gas). Of course, there are more "traditional" methods of pollution prevention such as improving the efficiency of a production process (boilers or other equipment), fuel substitution, renewable energy sources, etc.

II. APPLICABILITY

Facilities that are required to submit to the United States Environmental Protection Agency (USEPA) a toxic chemical release form (Form R) under Section 313 of the federal Emergency and Community Right to Know Act of 1986 (EPCRA) are covered under the New Jersey Pollution Prevention Act (N.J.S.A. 13:1D-35), and are subject to its pollution prevention planning regulations (N.J.A.C. 7:1K).

Each covered facility must conduct pollution prevention planning for all toxic chemicals on the EPCRA Section 313 Toxic Chemical List that it manufactures, processes or otherwise uses in excess of 10,000 pounds per year.

The differences in thresholds between New Jersey pollution prevention planning and USEPA Form R reporting must be noted. The USEPA threshold for submitting a Form R is 25,000 pounds per year per chemical for manufacturing and processing, and 10,000 pounds per year per chemical for otherwise use. Therefore, in the cases of manufacturing and processing a facility is not subject to Form R reporting until the 25,000-pound threshold is met. **However, once a facility is subject to Form R reporting, even for one chemical, it is subject to the pollution prevention planning regulations for all EPCRA chemicals above the 10,000-pound threshold.**

In addition to Form R reporting to the USEPA, some facilities may be eligible for Form A reporting, a simplification of Form R for those facilities that meet an Alternate Threshold specified by the USEPA. Any facility that uses less than 1,000,000 pounds of a chemical per year, and at the same time, generates less than 500 pounds of nonproduct output per year, is eligible to submit a Form A instead of a Form R. Any facility that submits only Form As under EPCRA Section 313 is not subject to the pollution prevention planning regulations. **However, any facility that submits a Form A for one or more chemicals and is also required to submit a Form R, even for only one chemical, is subject to the pollution prevention planning regulations for all chemicals on the EPCRA Section 313 Toxic Chemical List.**

Facilities should refer to EPA's EPCRA Section 313 Industry Guidance "Electric Generating Facilities" for a detailed description of the types of hazardous substances that may be used or generated at electric generating facilities, the threshold quantities for triggering coverage, and descriptions of whether certain hazardous substances are considered manufactured, processed, or otherwise used. For example, the components of fuel are

classified as otherwise used when the fuel is combusted on-site, so the 10,000 pound threshold for substances otherwise used will apply.

Table 1 (from "EPCRA Section 313 Industry Guidance: Electricity Generating Facilities") includes lists of chemicals commonly manufactured, processed or otherwise used at electricity generating facilities. This is not a comprehensive list of all chemicals that may be manufactured, processed or otherwise used at electricity generating facilities, but it is a good starting point to identify chemicals.

Table 1

Chemicals that may be manufactured during combustion	Chemicals that facilities may process (in ash)	Chemicals that facilities may otherwise use
Antimony compounds	Antimony compounds	Ammonia
Arsenic compounds	Arsenic compounds	Bromine
Barium compounds	Barium compounds	Chlorine
Cadmium compounds	Cadmium compounds	Chlorine dioxide
Chromium compounds	Chromium compounds	Copper compounds
Copper compounds	Copper compounds	Ethylene glycol
Formaldehyde	Lead compounds	Formic acid
Hydrochloric acid (acid aerosols)	Manganese compounds	Hydrazine
Hydrogen fluoride	Mercury	Hydrochloric acid (acid aerosols)
Lead compounds	Nickel compounds	PAC compounds
Manganese compounds	Selenium compounds	Thiourea
Mercury/Mercury compounds	Silver compounds	1,2,4 Trimethylbenzene
Nickel compounds	Vanadium fume or dust	Zinc compounds
Selenium compounds	Zinc compounds	
Silver compounds		
Sulfuric acid (acid aerosols)		
Vanadium fume or dust		
Zinc compounds		

III. P2 PLAN ELEMENTS

A. CERTIFICATIONS [N.J.A.C. 7:1K-4.3(b)1]

The highest ranking corporate official with direct operating responsibility at the industrial facility shall sign the following certification:

"I certify under penalty of law that I have read the Pollution Prevention Plan and that the Pollution Prevention Plan is true, accurate, and complete to the best of my knowledge."

The highest ranking corporate official at the industrial facility shall sign the following certification:

"I certify under penalty of law that I am familiar with the Pollution Prevention Plan and that it is the corporate policy of this industrial facility to achieve the goals of the Pollution Prevention Plan."

B. FACILITY LEVEL MATERIALS ACCOUNTING DATA [N.J.A.C. 7:1K-4.3(b)2]

1. These data elements are the same as those reported on the DEQ-114, the Release and Pollution Prevention Report (RPPR), in Section B, except for use quantities, which must be calculated. Therefore, inclusion of the RPPR is acceptable; however, use quantities must also be included.
2. It is recommended that facilities also include annual air emissions of priority pollutants, as well as any air permit limits for toxics that may be included in previously issued air permits. Studies conducted by DEP and continuing work conducted by facilities and DEP have revealed inconsistencies in data. Data reconciliation may be necessary to complete the material balance.

C. PROCESS LEVEL MATERIALS INFORMATION [N.J.A.C. 7:1K-4.3(b)3 and 4]

1. Identification of all processes and units of production

Facilities have some flexibility in choosing units of production. In the simplest sense, a utility produces electricity. The facility can consider production of electricity to be its only production process. This can be measured in kilowatt hours, megawatt hours, or whatever unit is appropriate for the particular facility. If a facility chooses to report this way, the process level materials accounting data may be identical to the facility level materials accounting data.

On the other hand, facilities may want to consider breaking out various process units or steps and considering them to be separate production units, especially if this results in meaningful units of production. For example, a facility has 2 boilers of different ages, types and efficiencies. This facility may want to consider them separately so that the data results in a more accurate measure of efficiency. Boiler A may produce 50 pounds of nonproduct output per kilowatt hour and Boiler B may produce 25 pounds of nonproduct output per kilowatt hour. Another example might be a facility that uses 2 different fuel types that result in different levels of nonproduct output and associated pollutant releases. Generating a simple process flow diagram (such as the one below) for each process is highly recommended. Process flow diagrams are very useful in determining all the steps in a single process and indicating possible sources of NPO. One process might include several steps including fuel storage, fuel loading, fuel combustion, and treatment of combustion byproducts. (see flow diagram on next page)

2. The Pollution Prevention Process-Level Data Worksheet (P2-115) must be filled out for each hazardous substance in each process (see sample on Page 12). Effective April 2000, new regulations require that facilities maintain process-level data worksheets for all processes, both targeted and non-targeted. The information contained in these worksheets (see completed sample) allows the facility to calculate annual changes in use and nonproduct output (NPO) at the process level. NPO includes all hazardous substances or hazardous wastes that are generated prior to storage, out-of-process recycling, treatment, control or disposal, and that are not intended for use as a product.

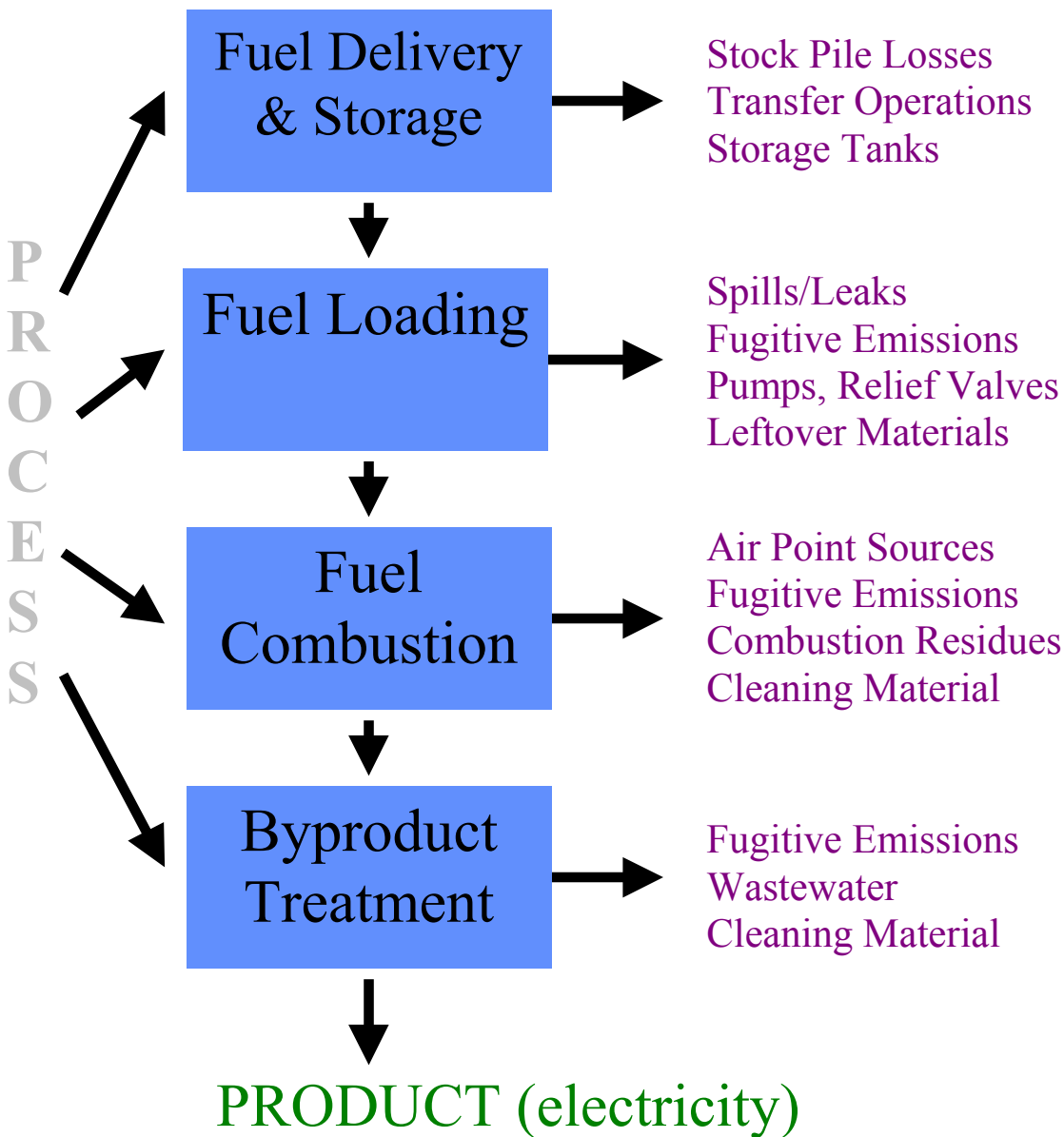
Note that quantities of hazardous substances that are "used" at utilities must be accounted for in one of three categories: those substances are either chemically consumed (in a chemical reaction or through combustion), manufactured (as byproducts from combustion reactions), or end up as NPO. Types of hazardous substances that are present at utilities include a variety of metals, certain acids and other possibly other organic compounds such as toluene and xylene. It seems likely that none of these substances will end up as product, i.e., electricity. Metals cannot be

chemically consumed, so for these substances it is likely that the quantities used and quantities generated as NPO will be the same. Acids are often chemically consumed, especially during treatment, although some quantities are often released or transferred off site.

Once NPO quantities have been estimated using emission factors, direct measurement (of emissions or fuel sources), or other means, the estimates should be checked against any other related environmental data. This could include air emission data, air permit limits, water point source releases, input locations to POTWs, etc. If no other data sources exist for estimating emissions, facilities should refer to emission factors found in *"EPCRA Section 313 Industry Guidance: Electricity Generating Facilities", Chapter 3*.

Process Flow Diagram for Electricity Generating Facilities

SOURCES



3. Similar processes may be grouped together. For example, facilities may want to group one or more combustion units and consider them to be a single production process. This may simplify data collection and reporting and allow facilities to concentrate their efforts on pollution prevention methods that will reduce hazardous substance use, nonproduct output and releases. If a facility elects to group processes, it should describe the reasons for doing so.
4. Process level NPO can be determined by summing up all the sources of NPO within a process. Determining quantitatively the amount of NPO at each source allows the facility to focus its resources on those sources that contribute to the greatest losses. While facilities are required to measure NPO as pounds of hazardous substance before treatment or control, facilities should also consider quantifying the pounds of all pollutants generated by the facility and look for pollution prevention methods to reduce them. By doing this, facilities can develop a pollution prevention plan that summarizes the "environmental footprint" for that facility and can identify long term environmental goals to reduce its impacts.

D. HAZARDOUS WASTE DATA [N.J.A.C. 7:1K-4.3(b)5]

1. Facility Level Data (Inclusion of the Hazardous Waste Biannual Report may be sufficient; however, since the Report is only submitted every two years, this data may not be up to date. If it is not, the Report is not sufficient.)
2. At the Process Level, the pounds of each hazardous waste generated at each production process must be identified. The most important part of this step of the pollution prevention plan is identification of the **source** of the hazardous waste in each production process, (i.e., where in the process it is generated.) Some sources of hazardous waste within a process may include: acid aerosols resulting from combustion of fuels, metal dusts resulting from combustion of fuels, and residues or filters from treatment or control devices.

E. COST DATA [N.J.A.C. 7:1K-4.3(b)6]

An estimate must be included for each source or production process, of the costs of using hazardous substances including at a minimum: storage and handling, monitoring, tracking, reporting, treatment, transportation and disposal, manifest and labeling, permit fees, and liability insurance. Some facilities have developed useful cost accounting metrics like cost per pound of nonproduct output generated that allow them to target the most cost effective environmental improvements to their production processes. There are many cost accounting case studies available, many of which are available via EPA's Environmental Accounting Project website at www.epa.gov/opptintr/acctg/. Facilities may be interested in using free cost accounting software developed by Tellus Institute in conjunction with EPA and DEP called P2/FINANCE (see www.epa.gov/opptintr/acctg/download/p2finan.htm) and E2/FINANCE (see www.tellus.org/general/software.html).

F. DATA UPDATES [N.J.A.C. 7:1K-4.3(c)1, 2, and 3]

Each year following the base year the Plan must be updated. This is achieved by updating the Pollution Prevention Process-Level Data Worksheets and completing a Release and Pollution Prevention Report (RPPR). Facilities will have the option of sending a completed Pollution

Prevention Process-Level Data Worksheet (P2-115) to the Office of Pollution Prevention and Permit Coordination, who will then complete the necessary calculations to determine pollution prevention progress (see N.J.A.C. 7:1K-6).

G. IDENTIFY TARGETED PROCESSES [N.J.A.C. 7:1K-4.4]

Facilities need to target production processes that contribute 90% or more of total hazardous substance use, NPO or releases. Facilities are encouraged to target all processes, since cost-effective opportunities for pollution prevention are not limited to the processes that generate the most NPO or releases.

H. ESTIMATE SOURCE LEVEL NPO [N.J.A.C. 7:1K-4.5(a)2]

1. Estimate in pounds the annual quantities of each hazardous substance generated as NPO at each source within each targeted production process. Total source level NPO for each process should equal the process level NPO. Estimating source level NPO is a critical step in pollution prevention planning. Use of the mass balancing method will increase the likelihood of identifying sources of NPO and associated P2 options. Often facilities' estimates of point source emissions are based on engineering calculations that have not been verified by either materials accounting data or by direct measurement. Often estimates of fugitive emissions are significantly lower than they actually are and materials accounting data plays an important role in this type of data analysis. Sometimes actual sources have been missed entirely, in part because of past environmental efforts that focus on the end of the pipe, rather than the entire production process. Once NPO quantities have been estimated using emission factors, direct measurement (of emissions or fuel sources), or other means, the estimates should be checked against any other related environmental data. This could include air emission data, air permit limits, water point source releases, input locations to POTWs, etc.
2. Examples of source level NPO might include some of the following for SIC 4911, 4931 and 4939 include: relief valves, pumps, stacks, volatilization from process or treatment, fittings, transfer operations, flanges, storage tanks, stock pile losses, process discharge stream losses, container residues, recycling and energy recovery byproducts, accidental spills and releases, storm water runoff, housekeeping practices, treatment sludge and combustion byproducts.

I. IDENTIFYING POLLUTION PREVENTION OPTIONS [N.J.A.C. 7:1K-4.5(a)4]

1. Identify pollution prevention options that reduce the use and generation of hazardous substances. Employees who work with the targeted processes should get actively involved in this step by submitting pollution prevention ideas or attending brainstorming sessions. There are many possibilities for pollution prevention activities that may be applicable, which fall under the following categories: raw material substitution, product reformulation, production process modification, in-process recycling, or improved operation and maintenance of production process equipment. It should be remembered that, although some ideas may seem impractical now, they should still be included here. Those options could become viable in the future due to changes in technology or costs, so it will be helpful to have a record of those ideas for future revisions of the plan.
2. Some possibilities for SIC codes 4911, 4931 and 4939 may include:
 - a. Pollution Prevention Options Specific to Individual Facilities

Nonproduct output and emissions from fuel oil or coal combustion will vary with the grade and composition of the fuel, the type and size of the boiler, the firing and loading practices used, and the frequency and types of equipment maintenance. Therefore, these are pollution prevention opportunities that should be considered. Generally, the more efficient the fuel combustion, the more pollution is prevented. Opportunities include improved housekeeping (frequent checking of valves, pumps, fittings, flanges; prevention of accidental spills or releases; improved storage practices to prevent losses, etc.) and process modifications (changes in treatment methods or recovery operations; changes in equipment that result in improved combustion efficiencies, etc.).

b. General Pollution Prevention Options for the Energy Production Sector

One pollution prevention option for electricity generating industries is raw material substitution or fuel switching. If feasible, facilities can switch from coal to less polluting fuels, from high sulfur coal to low sulfur coal, or even better, it can switch to renewable sources. Efforts that reduce the demand for energy can be considered pollution prevention, including current efforts that result in future reductions. The Department is developing a variety of incentive programs that are designed to reward and encourage voluntary CO₂ reductions that will bring the state closer to meeting its Greenhouse Gas Action Plan goals. These include the Silver Track II and Gold Track programs, where facilities that implement CO₂ reductions may be eligible for regulatory flexibility and special recognition. Another effort under development are Greenhouse Gas credits under the Open Market Emissions Trading Program, where facilities may qualify for emission credits that can be traded or sold.

J. FEASIBILITY ANALYSIS [N.J.A.C. 7:1K-4.5(a)5i and ii]

1. Technical analysis

The purpose of a technical analysis is to determine whether a proposed option is possible, regardless of financial constraints.

2. Financial analysis

Facilities need to estimate the cost of implementing pollution prevention options, as well as potential savings that may result from decreased raw material costs, improved efficiency, decreased operation and maintenance costs, decreased environmental compliance costs, etc. Other less tangible costs not typically quantified include improved public perception and savings that might result from achieving emission credits.

3. Reasons for not implementing options

If a facility elects not to implement pollution prevention options that would achieve reductions larger than those chosen by the facility, the facility should describe its rationale for not implementing these options. Was the payback period for the pollution prevention option longer than typically allowed by the parent company? Is the facility only going to be in operation for a short time?

K. 5 YEAR GOALS WITH IMPLEMENTATION SCHEDULE [N.J.A.C. 7:1K-4.5(a) 6-12]

(DEP-113, the Pollution Prevention Plan Summary will be sufficient for 1, 2, and 4. Please refer to the Plan Summary instructions for more detail.)

1. Pounds per unit of product

Determine the amount of pounds of each hazardous substance per unit of product by which the facility anticipates reducing its annual use and NPO generation. It is important to do this on a per unit of product basis to account for changes that are a result of increased process efficiencies, and not due to production changes. Remember that these goals are not legally binding so each facility is encouraged to set realistically ambitious goals.

2. Percent

The planned reductions should be calculated as a percentage.

3. Impact on releases

The impact of planned pollution prevention reductions on releases to air and water at the facility should be calculated. In some cases, reductions in releases may result in eliminating the need for permits or other regulatory approvals. Facilities should refer to "*EPCRA Section 313 Industry Guidance: Electricity Generating Facilities*", Chapter 4 for more detailed information on estimating releases to air, water or waste.

4. Estimated schedule for implementation

Implementation schedules are a way of planning around resource and timing problems. Some goals can be accomplished immediately, while others may have short-, mid-, or long-range timing. It is therefore important to determine a schedule for implementation as a reminder of the facility's plans. This schedule can be modified at any time to reflect new options or changed time frames.

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Superpower Utility
 2000 Lightning Lane
 Bright Sky, NJ 00000
 88899900000
 JOHN DOE (609) 555-1234



PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance at each process.)

PROCESS NAME: Fuel Combustion
 PROCESS I.D. (from Plan Summary) GEN 001
 UNITS OF PRODUCTION Megawatt hours
 Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) Y

HAZARDOUS SUBSTANCE: Formaldehyde		CAS No. 50-00-0				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	56 MWH					
USE (pounds)	12,000					
Consumed	0					
Shipped off-site as (or in) product	0					
NPO (pounds)	12,000					
Recycled out of process	0					
Destroyed: on site treatment	10,970					
Destroyed: on site energy recovery	0					
Stack air emissions	10					
Fugitive air emissions	20					
Discharge to POTWs	1,000					
Discharge to groundwaters	0					
Discharge to surface waters	0					
On site land disposal	0					
Transferred off site	0					
P2 techniques used or planned in given year (code in 1999 RPPR Instructions, Appendix E)	N/A	W58				
Was this process discontinued or sent off site in given year? (Y/N)	N/A					
Did facility make process change(s) that triggered Plan modification? (Y/N)	N/A					
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation.)	N/A					

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature Ray Ovligh Date June 30, 2000 Phone No. (609)555-1234
 Name (print) Ray Ovligh Title President

References

Industrial Pollution Prevention Planning: Meeting Requirements Under the New Jersey Pollution Prevention Act, N.J. Department of Environmental Protection, Office of Pollution Prevention, September 1995, Second Edition.

EPCRA Section 313 Industry Guidance: Electricity Generating Facilities, U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Washington, D.C., January 1999.